Flash Drive/Reader with Serial-Port Controller and Flash-Memory Controller Mastering a Second RAM-Buffer Bus Parallel to a CPU Bus

Abstract

A flash-drive or flash-card reader connects to a personal computer (PC) through a serial link such as a Universal-Serial-Bus (USB), IEEE 1394, SATA, or IDE. A local CPU acts as the bus master of a CPU bus that connects to slave ports on a flash-memory controller, a serial engine, and a RAM buffer. A second bus in parallel to the CPU bus connects a second slave port on the RAM buffer to a master port on the flash-memory controller and to a master port on the serial engine. The flash-memory controller or the serial engine can use their master ports to transfer data to and from the RAM buffer using the second bus, allowing the CPU to retain control of the CPU bus. The second bus is a flash-serial buffer bus that improves data transfer rates. The flash-memory controller can prefetch into the RAM buffer.